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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,167	03/10/2006	Mohammad Jaber Borran	088245-0799	8220
23524 7590 10/15/2009 FOLEY & LARDNER LLP 150 EAST GILMAN STREET P.O. BOX 1497 MADISON, WI 53701-1497				
EXAMINER BURD, KEVIN MICHAEL				
ART UNIT 2611		PAPER NUMBER		
MAIL DATE 10/15/2009		DELIVERY MODE PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/523,167

Applicant(s)

BORRAN ET AL.

Examiner

Kevin M. Burd

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 October 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 26-53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 26-53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SE/US)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

1. This office action, in response to the amendment and the request for continued examination filed 10/7/2009, is a final office action.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/7/2009 has been entered.

3. All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Response to Arguments

4. Applicant's arguments filed 10/7/2009 have been fully considered but they are not persuasive. Applicant states Fette fails to disclose a signal constellation based on a channel estimation error. The examiner disagrees. Fette discloses the communication system selects a coefficient constellation based on SNR. The SNR is an estimation of the quality of the channel used for communication. The channel quality is a channel estimation and errors in the channel quality (a reduced level of channel quality) represent channel estimation errors. The level of the signal is determined as is the level of the noise present in the channel to determine a signal-to-noise-ratio (SNR). The noise or distortion present in the communication channel is a channel estimation error since the noise or distortion represents errors in the channel. When little or no distortion is detected, the error is minimized and the signal is transmitted with minimal interference. Applicant states the constellation, cepstral lines, FEC and baud rate are not used to select the constellation and none are channel estimation errors. This is irrelevant since these features are not relied on in the previous rejection of the claims. Applicant is arguing features that are not found in the claims. The after final amendment presented 9/8/2009 was not entered and applicant has presented new claim

amendments with the RCE. If these new claim amendments were presented in the after final amendment, the amendment would have been entered after final, and the finality of the rejection of the claims would have been maintained because the prior art discloses this amended feature as stated in the previous office actions.

5. The provisional double patenting rejection of the claims is maintained.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 26, 27, 30, 31, 35, 36, 39, 40, 44-49 and 51-53 are rejected under 35 U.S.C. 102(e) as being anticipated by Fette et al (US 6,560,445).

Regarding claims 26, 27, 30, 31, 35, 36, 39, 40, 45-49 and 51-53, Fette discloses a method of and apparatus for processing a received space-time constellation. The signal to noise ratio (SNR) of each coefficient is used to determine the constellation that will be used for transmission (column 8, lines 20-51). The SNR is an estimation of the quality of the channel used for communication. The channel quality is a channel estimation and errors in the channel quality (a reduced level of channel quality) represent channel estimation errors. The level of the signal is determined as is the level

of the noise present in the channel to determine a signal-to-noise-ratio (SNR). The noise or distortion present in the communication channel is a channel estimation error since the noise or distortion represents errors in the channel. When little or no distortion is detected, the error is minimized and the signal is transmitted with minimal interference. The receiver will transmit the channel conditions to the transmitter (abstract) and "in response to predetermined conditions selects a cepstral constellation to be utilized." (abstract). The receiver will demodulate the received signal to recover the transmitted data.

Regarding claim 44, Fette discloses the communication system shown in figure 18. The transceivers comprise transmitter and receiver components and can be either a base station, mobile station or both.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 28, 29, 37 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fette et al (US 6,560,445) in view of Seshadri et al (US 2002/0090035).

Regarding claims 28 and 37, Fette discloses the method and apparatus stated above. Fette does not disclose using multiple receive antennas. Seshadri discloses

utilizing multiple receive antennas in the communication system (figure 1). "It is well known that using a diversity scheme can improve the signal-to-noise ratio of a received information signal in a telecommunication system" (paragraph 0003). The receiver diversity scheme is shown in the figure. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teaching of Seshadri into the method and apparatus of Fette.

Regarding claims 29 and 38, Fette discloses the method and apparatus stated above. Fette does not disclose decoding the demodulated signal using an outer code that includes codes over a plurality of signal matrices across time. Seshadri discloses the receiver shown in figure 3. The demodulator 312 is coupled to decoder 314. Paragraph 0104 discloses the decoding of the received signal utilizing outer trellis code in orthogonal matrices generated by the space time block code. By concatenating an outer trellis code designed for additive white Gaussian noise (AWGN) channel with space time block code additional performance gain is obtained (paragraph 0104). For this reason, it would have been obvious to incorporate the decoder of Seshadri into the method and apparatus of Fette.

8. Claims 32, 41 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fette et al (US 6,560,445) in view of Dabak et al "Signal Constellations for Non-Gaussian Communication problems" Statistical Signal and Array Processing. Minneapolis, April 27-30 1993. Proceedings of the International Conference on

Acoustics, Speech, and signal Processing (ICASSP), New York, IEEE, US, VOL. 4, pages 33-36.

Regarding claims 32, 41 and 50, Fette discloses the method and apparatus stated above. Fette does not disclose the distance between the constellation points as a function of a Kullback-Leiber distance. However, Dabak discloses a method of computing optimum signal sets (abstract). By optimizing the constellation points for non-Gaussian communication problems, the problems can be overcome and proper communication between users can be achieved. This optimization is achieved since the Kullback information can be used to express how performance varies with noise amplitude distribution and with signal set choice (III). Additional information regarding the Kullback information is provided in heading II. It would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teachings of Dabak into the method of Fette for the reasons stated above.

9. Claims 33, 34, 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fette et al (US 6,560,445) in view of Hui et al (US 6,674,820).

Regarding claims 33, 34, 42 and 43, Fette discloses the method and apparatus stated above. Fette does not disclose utilizing a maximum likelihood coherent demodulator to demodulate the received signal. Hui discloses to extract the transmitted signal of symbols from the received signal. The receiver will typically include a demodulator which may be a coherent demodulator such as a maximum likelihood sequence estimation demodulator. To adapt to channel variations from each data burst

to the next, an associated channel estimator is typically provided for the demodulator (column 1, lines 57-65). For these reasons and to use typical components to minimize the size and complexity of the circuitry, it would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the typical demodulator of Hui into the method and apparatus of Fette.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 26, 27, 30-32, 35, 36, 39-41, 45-53 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 41, 42, 45, 49, 50 and 57-58 of copending Application No. 10/671,346. Although the conflicting claims are not identical, they are not patentably distinct from each other

because 10/671,346 discloses a method of establishing a constellation by determining a characteristic of a channel (claim 41). The characteristic is the SNR (claim 42). The selected constellation is that utilized for the transmission and the input bit stream is encoded in an amplitude of the symbols (claim 41). The reference discloses more detail than the instant claims. However, the more specific "anticipates" the broader (see *In re Goodman* – 29 USPQ2d 2010).

Claims 26, 27, 30-32, 51 and 52 correspond to claim 42 of the reference.

Claims 49 and 50 correspond to claim 57 of the reference.

Claims 35, 36, 39-41, 45-48 and 53 correspond to claim 49 of the reference.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sridhar et al (US 5,007,047) discloses the invention features monitoring the quality of the channel and selecting a signal point constellation for modulation based on the monitored channel quality (column 3, lines 41-44). The quality of the channel is determined based on a linear combination of the separate analyses of the channel distortion and the residual echo component. The controller requests the device to shift to a higher level modulation scheme according to the quality (column 2, lines 48-64). Typical channel noise includes idle noise, which is present even when no signal is being

transmitted. Signal induced noise impairs the quality of the channel and reduces the signal-to-noise ratio of the transmitted signals (column 1, lines 24-35).

Shattil (US 2004/0100897) discloses the channel estimation processor 812 and constellation selector 811 of figure 8. A constellation selector 811 selects data symbol constellations and may be adapted with respect to any various performance measurements, including channel estimates, probability of error, SNR, SINR, BER, etc. (paragraph 0086). Accordingly, the channel estimation processor 812 may be coupled to the constellation selector 811 (paragraph 0086).

Hartman, JR. (US 2002/0075830) discloses the measured quality of the upstream channel is determined and compared to stored threshold values for the use of the encoding scheme and symbol constellations. When the symbol constellation is found for which the measured signal quality meets the stored threshold values, the symbol constellation is selected as the optimal symbol constellation (paragraph 0052). No changes are necessary.

All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Burd whose telephone number is (571) 272-3008. The examiner can normally be reached on Monday - Friday 9 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Payne can be reached on (571) 272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kevin M. Burd/
Primary Examiner, Art Unit 2611
10/12/2009